REMARKS

Claim 1 is currently pending in this application. By this Reply, claim 1 has been amended to address only the section 112 rejection raised in the Action. No new matter has been introduced into the application by this amendment.

In the Action, claim 1 was rejected under 35 U.S.C. 112, second paragraph, as indefinite. Applicants have amended claim 1 to address the informality noted in the Action by providing proper antecedents for the "inwardly facing" races and the "outwardly facing" races. Accordingly, withdrawal of this rejection is respectfully requested.

In the Action, the rejection of claim 1 as obvious under 35 U.S.C. 103 in view of the combination of Griswold (US 2,135,477), Rohn (US 1,325,113) and Ebert (DE 35 22 600 A1) was made final. Applicants respectfully request reconsideration in view of the Examiner's comments that it would be obvious to substitute the type of bearings provided by Rohn into the arrangement of Griswold.

Griswold discloses two single row ball bearings in an O-arrangement used in an differential to support the bevel-pinion shaft. This type of O-arrangement is shown in the attached text Walzlager (Rolling Bearings) by M. Albert, et al. page 25, Figure 1.18. Rohn is directed to an arrangement of a twin multiple row, angular contact ball bearing arranged on a shaft, with the bearings in an X-arrangement. See Walzlager

(Rolling Bearings), page 25, Figure 1.19. Additionally, as shown in the drawings and explained in the specification, the outer bearing sleeve (14) for each of the bearings has external threading, and the sleeves (14) are threaded into the mating threads (22, 23) at either end of the casing (21). This requires the inwardly facing races of the bearings to have a larger diameter, creating a different loading than is preferred for a differential, especially with an O-arrangement of the bearings. The axial pretension of each of the Rohn bearings is individually adjusted via tightening of the respective sleeve (14).

There is no suggestion in the Action as to how or why one of ordinary skill in the art would take the Rohn bearing arrangement (which has specifically designed bearings in an X-arrangement) and then substitute this type of bearing into Griswold where the bearings are in an O-arrangement. This would make the Rohn arrangement unsuitable for its intended and disclosed use. If the references are combined, this would take the Rohn bearing with its externally threaded outer races and place it in a threaded housing for pre-tensioning in an O-arrangement, making pretensioning according to Rohn impossible as the inner races are exposed at the outer sides. If a proposed modification of the prior art changes the principle of operationof the prior art invention being modified, then the teachings of the reference are not sufficient to render the claim obvious. See M.P.E.P. 2143.01.

Even if the references were combinable, as suggested in the Action, then the other features that comprise the Rohn bearing arrangement cannot be ignored, or selectively picked and chosen from using Applicants' invention as a blueprint for combining the selected pieces to make an obviousness rejection. As Rohn provides for individual pre-tensioning of the bearings, this cannot be ignored in the proposed combination. Accordingly, there would be no need for a deformable sleeve of Ebert for pre-tensioning of the bearings, and even if it were provided, it would clearly change the principle of operation of the Rohn bearing arrangement. Accordingly, it is respectfully submitted that claim 1 is not suggested or disclosed by the combination recited in the action.

Additionally, Ebert shows a deformable sleeve (9) in connection with a known differential arrangement using tapered roller bearings. However, the Ebert does not even act in the same manner as the deformable sleeve recited in claim 1. According to the present invention, the deformable sleeve acts against an end of a shank (15) of the bevel-pinion shaft (5) so that both angular contact ball bearings can be pre-tensioned by adjusting a single threaded piece (11) on the bevel-pinion shaft. Ebert shows a deformable sleeve (9) that acts on the inner bearing ring of one bearing and also, via the spacer (10), against the inner bearing ring of the other bearing. Accordingly, this can not suggest the present invention wherein the deformable sleeve acts against a shank on the pinion shaft.

Accordingly, claim 1 should also be patentable over this combination for this reason, as well as the reasons noted above. Accordingly, withdrawal of this section 103 rejection is respectfully requested.

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claim 1, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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Enclosure

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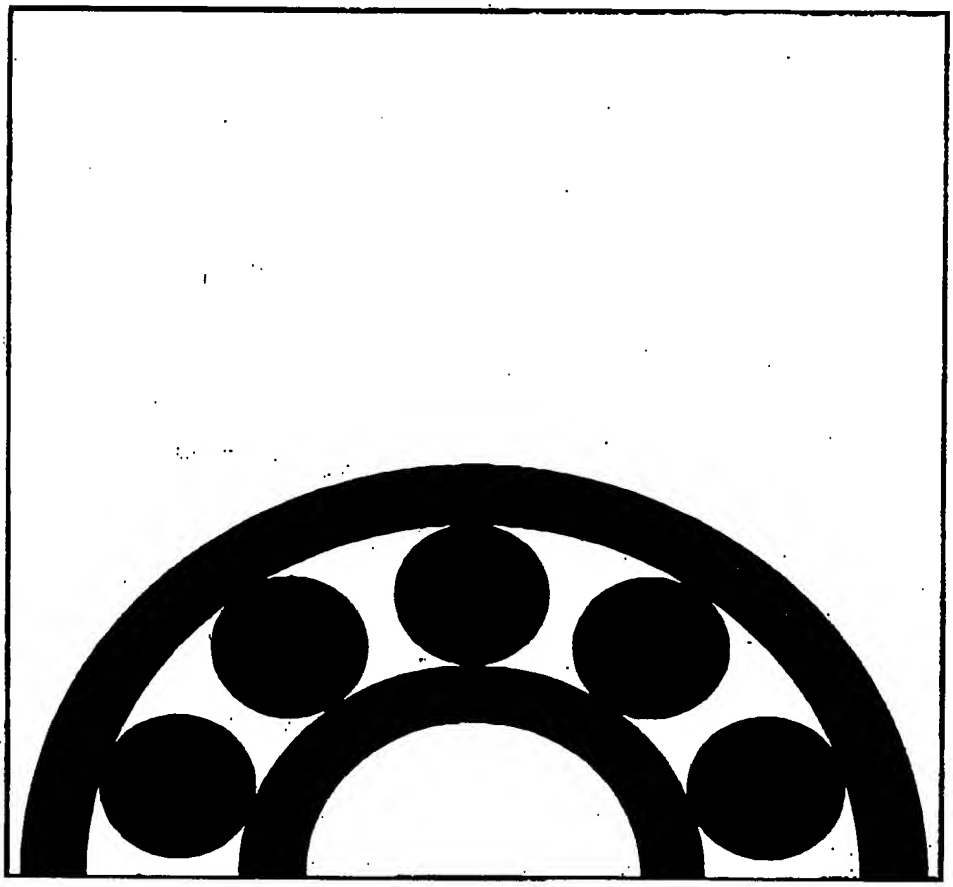
WÄLZLAGER



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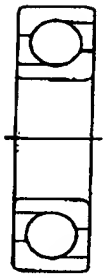

Abb. 1.16. Einreihiges Schrägkugellager

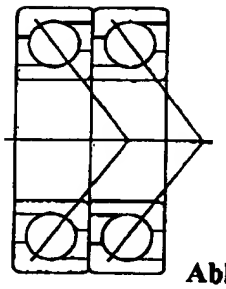

Abb. 1. 17.Schrägkugellager, Tandem-Anordnung

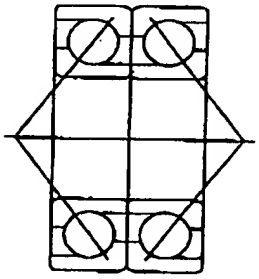

Abb. 1.18. Schrägkugellager, O-Anordnung

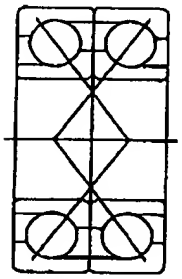

Abb. 1.19. Schrägkugellager, X-Anordnung

O-Anordnung (engl.: back to back) (Abb. 1.18)

Axialkräfte werden in beiden Richtungen, jeweils von einem Lager, aufgenommen. Wegen der großen Stützbreite ist diese Lagerung sehr starr und nimmt große Kippmomente auf. Bei Lagerungen mit mehreren Lagerstellen werden Belastungen um so besser übertragen, je genauer die Lagerstellen fluchten.

X-Anordnung (engl.: face to face) (Abb. 1.19)

Axialkräfte werden wie bei der O-Anordnung in beiden Richtungen, jeweils von einem Lager, aufgenommen. Die kleine Stützbreite stellt bei Lagerungen mit mehreren Lagerstellen keine großen Anforderungen an die Genauigkeit der Fluchtung. Kippmomente werden allerdings wegen der geringeren Starrheit der Anordnung weniger gut aufgenommen.

Wird die Welle nach j5 und die Gehäusebohrung nach J6 bearbeitet, so ist bei O- und X-Anordnung eine geringe Lagerluft vorhanden.

Vierpunktlager (Abb. 1.20)

Vierpunktlager sind einreihige Schrägkugellager mit geteiltem Innenring und einem Druckwinkel von 35°. Sie nehmen in gleicher Weise Axialbelastungen in beiden Richtungen auf. Bei einem Kräfteverhältnis von $F_a/F_r \geqq 1{,}27$ entstehen optimale Laufbedingungen. Vierpunktlager sind für hohe Drehzahlen geeignet. Der Außenring mit dem Kugelkranz wird getrennt vom geteilten Innenring eingebaut. Bei